

# Genus *Pseudocera* Walker (Lepidoptera: Pyralidae: Epipaschiinae) new to China, with descriptions of two new species

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**Abstract:** The genus *Pseudocera* Walker, 1863 from China is reviewed. *Pseudocera elliptica* sp. nov. and *P. microda* sp. nov. are described as new, and *P. rubrescens* is newly recorded in China. Photographs of adults and genitalia are provided. A key to the three species in China is given based on the male genitalia.

**Key words:** Microlepidoptera; Pyraloidea; taxonomy; new record

中国新纪录属——伪丛螟属 *Pseudocera* Walker 及二新种记述（鳞翅目：螟蛾科：丛螟亚科）

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**摘要:** 对中国伪丛螟属 *Pseudocera* Walker, 1863 进行了分类研究。描述了 2 个新种：椭圆伪丛螟 *Pseudocera elliptica* sp. nov. 和对微齿伪丛螟 *P. microda* sp. nov., 报道了 1 个中国新纪录种：红伪丛螟 *P. rubrescens*。提供了中国种的成虫和外生殖器特征图, 并依据雄性外生殖器特征编制了分种检索表。

**关键词:** 小蛾类; 螟蛾总科; 分类学; 中国新纪录

## Introduction

The genus *Pseudocera* was established by Walker (1863) with *P. inconcisa* Walker, 1863 as the type species. *Pseudocera* had been treated as a synonym of *Stericta* for a long time until Shaffer *et al.* (1996) restored it as a valid genus. Shaffer *et al.* (1996) transferred *Orthaga trissosticha* Turner, 1932 to *Pseudocera*; Sutton *et al.* (2015) transferred *Coenodomus schausi* (West, 1931), *Coenodomus rubrescens* (Hampson, 1903) and *Stericta angulosa* de Joannis, 1930 to *Pseudocera*. *Pseudocera rubrescens* was placed in the genus *Coenodomus* by Wang *et al.* (2017), but the unique characters of the male antenna and the female genitalia separate it from *Coenodomus*. *Pseudocera* was comprised of five species worldwide, occurring in the Oriental Region except *P. trissosticha* (Turner, 1932) that is distributed in the Australian Region. The aim of this paper is to record *Pseudocera* in China for the first time, to describe two new species, and to newly record one species from China on the basis of our study of the subfamily Epipaschiinae since 2007 (Wang 2007).

Accepted 4 July 2017. Published 25 December 2017. Published online 28 November 2017.

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## Material and methods

Specimens examined in this study were collected by light traps. Adults were examined using an Olympus SZX9 stereomicroscope. Permanent mounting of genitalia and venation follow the techniques introduced by Li (2002). Images of adults were taken using a Leica M205A stereomicroscope; images of genitalia were captured by using a Leica DM750 microscope and refined by using Photoshop CS5 software.

Specimens examined, including the types of the new species, are deposited in the Insect Collection of Nankai University (NKU), Tianjin.

## Taxonomy

### *Pseudocera* Walker, 1863, new record to China

*Pseudocera* Walker, 1863: 116.

Type species: *Pseudocera inconcisa* Walker, 1863, by monotypy.

Generic characters. Body medium in size. Head (Fig. 1). Labial palpus with longitudinal white stripes on both outer and dorsal surfaces of second segment. Maxillary palpus short and compressed in both male and female (except long and brush-like in male of *P. elliptica* sp. nov.). Antenna in male weakly serrate on ventral surface, with thin scape extension. Forewing (Figs. 2–4) with distinct antemedian and postmedian lines; with short yellow stripe usually stretching from anterior 1/6 and 1/2 of postmedian line reaching before apex and terminal line respectively; discal spot absent; discocellular spot represented by tufted scales; erect hair-like scales below basal half of lower margin of cell. Hindwing concolorous to forewing; postmedian line arched outward medially. Both wings covered with long black and white hair-like scales. Wing venation (Fig. 5). Forewing with  $M_1$  from upper angle of cell,  $M_2$  and  $M_3$  from lower angle of cell,  $CuA_1$  from before lower angle of cell; hindwing with  $Sc+R_1$  and  $Rs$  very close basally and widely apart distally,  $M_1$  and  $Rs$  from upper angle of cell,  $M_2$  and  $M_3$  from lower angle of cell.

Male genitalia (Figs. 6–8). Uncus sub-quadrate, with a pair of processes arising from near base and each close to lateral margin. Gnathos arms joined approximately from middle, distal process varied in shape. Valva with apex rounded, terminal margin oblique; costa banded, widened and extended basally; sacculus ill-defined. Tegumen laterobasally subdivided, forming a dorsal sclerite. Juxta more or less V-shaped, lateral lobes short. Phallus slender, with one cornutus.

Female genitalia (Fig. 9). Papillae anales strongly sclerotized and naked along edge. A sclerotized plate placed in intersegmental membrane between eighth tergite and papillae anales; eighth sternite membranous medially. Apophyses anteriores longer than apophyses posteriores, both widened at base. Lamella antevaginalis developed. Ductus bursae slender, membranous, with an arched spinous distal band shortly entering corpus bursae. Corpus bursae ovate, with dense denticles; signa two, with dense denticles.

Diagnosis. *Pseudocera* is diagnostic by the labial palpus with longitudinal white stripes on both outer and dorsal surfaces of second segment. *Pseudocera* is similar to *Coenodomus* Walsingham, 1888 in the wings covered with hair-like scales, the antemedian and postmedian lines distinct and the hindwing with a pattern similar to that of the forewing. *Pseudocera* can

be separated from *Coenodomus* by the antenna weakly serrate on the ventral surface in male, and by the ductus bursae having an arched spinous distal band shortly entering the corpus bursae in female genitalia. In *Coenodomus*, the antenna is bipectinate in male, and the ductus bursae lacks an arched spinous distal band.

### Key to *Pseudocera* species in China based on male genitalia

1. Gnathos with distal process knife-shaped .....2
- Gnathos with distal process elliptical (Fig. 8) ..... *P. elliptica* **sp. nov.**
2. Uncus with long spine-shaped processes arising from near base (Fig. 6) ..... *P. rubescens*
- Uncus with denticles arising from near base (Fig. 7) ..... *P. microda* **sp. nov.**

### *Pseudocera rubescens* (Hampson, 1903) (Figs. 2, 6, 9), new record to China

*Stericta rubescens* Hampson, 1903: 36. TL: India: Sikkim (Sikkim). TD: BMNH.

*Coenodomus rubescens* (Hampson): Solis, 1992: 282.

*Pseudocera rubescens* (Hampson): Sutton *et al.*, 2015: 58.

**Specimens examined.** 2♂1♀, **China**, Zhupo, Huitong County, Hunan, 23-VIII-2012, coll. Jinwei LI & Xiaohua CHEN, slide Nos. RH16314♀, RH16315♂; 1♀, Mt. Limushan, Hainan, 04-V-2011, coll. Dandan ZHANG & Lijun YANG, slide No. RH16312; 1♀, Mt. Limushan Forest Park, Hainan, 607 m, 26-X-2016, coll. Xia BAI, Shuonan QIAN & Wanding QI, slide No. RH16406; 1♀, Mt. Wuzhishan Nature Reserves, Hainan, 738 m, 27-VII-2016, coll. Xia BAI, Shuonan QIAN & Wanding QI, slide No. RH16153; 1♀, Tianchi, Jianfengling, Hainan, 787 m, 07-VIII-2016, coll. Xia BAI, Shuonan QIAN & Wanding QI; 3♂, Maolan Nature Reserves, Guizhou, 01-IX-2011, coll. Jinwei LI, slide No. RH16311; 1♂, Taiyanghe Nature Reserves, Yunnan, 1450 m, 11-VI-2014, coll. Zhenguo ZHANG, slide No. RH16014.

**Diagnosis.** *Pseudocera rubescens* is diagnosed by the uncus having paired long and distally hooked processes near base. It is more similar to *P. inconcisa* Walker, 1863 in the wing pattern, but can be distinguished by the short male scape extension about 1/5 length of the forewing; while in *P. inconcisa*, the long male scape extension is almost 1/2 length of the forewing (Robinson *et al.* 1994).

**Redescription.** Adult (Fig. 2) wingspan 22.0–25.0 mm. Head yellowish white mixed with fuscous. Male labial palpus with first segment white mixed with fuscous, about 1/4 length of second; second segment reaching vertex apically, fuscous, with longitudinal white stripes on outer and dorsal surfaces; third segment white, fuscous at base, tapering, about 1/3 length of second; female labial palpus slightly thicker than male. Maxillary palpus short and compressed in both male and female, white, mixed with fuscous apically. Antenna with ventral surface blackish fuscous, slightly serrate in male; dorsal surface white in male, blackish fuscous in female. Scape extension apically reaching anterior margin of mesothorax, white mixed with fuscous, with sparse short white hair-like scales ventrally. Thorax and tegula yellowish white mixed with black. Forewing grayish brown, suffused with dense black and pale yellowish fuscous scales; antemedian line black, extending from basal 2/5 of costal margin to basal 2/5 of CuP, then slightly inward to before middle of dorsum, edged with white fascia along inner margin; postmedian line black, extending from distal 1/3 of costal margin obliquely outward to CuA<sub>2</sub> at a short distance before termen, then inward to CuP, finally vertical to dorsum before tornus, edged with obscure yellowish white fascia along outer margin; longitudinal yellow stripe from antemedian line at posterior 2/5 to inner margin of postmedian line at posterior 1/4; terminal line black, indistinctly interrupted with white on veins;

short yellow stripe from anterior 1/6 and 1/2 of postmedian line reaching before apex and terminal line respectively; discal spot absent; discocellular spot represented by black mixed with white tuft; erect black mixed with white hair-like scales below basal half of lower margin of cell. Hindwing reddish fuscous, suffused with gray and white scales; postmedian line black, serrate, extending from middle of costal margin vertical to  $M_1$ , then obliquely outward to distal 1/3 of  $CuA_1$ , finally inward to middle of dorsum, edged with white along its outer margin. Cilia of both wings brownish yellow, interrupted with black on extension of veins; basal lines white. Legs white on inner side; on outer side, fore leg black, tarsus with longitudinal white stripes, mid leg white mixed with black, tarsus with longitudinal black stripe, hind leg white. Abdomen yellowish white on ventral surface; dorsal surface with 1st to 4th segments white mixed with black, remaining segments earthy yellow, black on posterior margin of each segment.

Male genitalia (Fig. 6). Uncus sub-quadrate, straight on posterior margin, covered with dense short setae dorsally; paired basal processes slender, curved, hooked distally, longer than uncus. Gnathos arms wide, joined from middle; distal process knife-shaped, pointed apically. Tegumen sclerite triangular, gradually narrowed to obtuse apex. Valva rhomboidal, rounded apically, straight terminally, with dense short hairs; costa reaching apex of valva, sub-rectangular basally, distal 1/5 slightly widened; sacculus reaching middle of ventral margin of valva, ill-defined. Juxta V-shaped, sclerotized anteriorly; lateral lobes short and thick, narrowed from base to narrowly rounded apex, extending inward. Phallus about 1.2 times length of ventral margin of valva, slightly curved at basal 1/3; cornutus fusiform, about 2/5 length of phallus.

Female genitalia (Fig. 9). Papillae anales with basal 1/4 collar-shaped, distal 3/4 semicircular, with dense long setae, strongly sclerotized and naked along edge. Apophyses anteriores about 1.3 times length of apophyses posteriores, slightly thicker, both widened at base. Eighth segment narrow, banded, with sparse long hairs posteriorly, sternite membranous medially; sclerotized inverted triangular plate placed in intersegmental membrane between eighth tergite and papillae anales. Ostium bursae large. Lamella antevaginalis banded, expanded medially, narrowed laterally, weakly sclerotized. Ductus bursae slender, membranous, with an arched spinous distal band shortly entering corpus bursae. Corpus bursae ovate, about 3/5 length of ductus bursae, with dense denticles; signa round conical, formed by depression from inner wall, with dense denticles.

Distribution. China (Guizhou, Hainan, Hunan, Yunnan); India.

***Pseudocera microda* sp. nov.** (Figs. 3, 7)

**Holotype.** ♂, **China**, Jianfengling, 18.45°N, 108.51°E, 969 m, Hainan, 12-IX-2013, coll. Weicai XIE, slide No. RH16313. **Paratype.** 1♂, Limushan Forest Park, 19.1°N, 109.44°E, 607 m, Hainan, 17-V-2015, coll. Peixin CONG, Wei GUAN & Sha HU, slide No. RH15518.

**Diagnosis.** This species is similar to *P. elliptica* sp. nov. and *P. rubrescens* both in the forewing pattern and in the male genitalia. *Pseudocera microda* sp. nov. can be separated from them by the uncus shallowly concave at middle on the posterior margin and with paired denticular processes near base; in *P. elliptica* sp. nov., the uncus is slightly convex at middle on the posterior margin and has the paired spine-shaped processes; in *P. rubrescens*, the uncus is straight on the posterior margin and has paired long and distally hooked processes near base.

**Description.** Adult (Fig. 3) wingspan 21.0–23.0 mm. Head yellowish white mixed with gray. Male labial palpus with first segment fuscous mixed with white, about 1/4 length of second; second segment reaching vertex apically, fuscous, with longitudinal white stripes on outer and dorsal

surfaces; third segment white, fuscous at base, tapering, about 1/3 length of second. Male maxillary palpus compressed and short, white. Male antenna with ventral surface blackish fuscous, slightly serrate, dorsal surface white. Scape extension apically reaching posterior margin of prothorax, narrowed from base to apex; white, with short yellowish white hair-like scales ventrally and apically. Thorax and tegula pale yellow mixed with fuscous. Forewing pale brownish yellow, with dense black and white scales; antemedian line black, extending from basal 2/5 of costal margin to basal 2/5 of dorsum, slightly curved at basal 2/5 of CuP, edged with white fascia along inner margin; postmedian line black, extending from distal 1/3 of costal margin obliquely inward to M<sub>1</sub>, then slightly outward to CuA<sub>1</sub>, again inward to CuP, finally vertical to dorsum before tornus, edged with obscure yellowish white fascia along outer margin; terminal line black, indistinctly interrupted with yellowish white on veins; short yellow stripe from anterior 1/6 and 1/2 of postmedian line reaching before apex and terminal line respectively; discal spot absent; discocellular spot represented by black mottled white tuft; erect black mixed with white hair-like scales below basal half of lower margin of cell. Hindwing pale brownish yellow, diffused with black and reddish fuscous scales; postmedian line black, serrate, extending from middle of costal margin vertical to M<sub>1</sub>, then obliquely outward to distal 1/4 of CuA<sub>2</sub>, finally inward to distal 1/3 of dorsum, edged with yellowish white along its outer margin; terminal line black. Cilia of both wings yellowish white, interrupted with black on extension of veins; basal lines yellowish white. Legs white except on outer side fore femur and tibia suffused with black scales, fore tarsus with longitudinal white stripes laterally, mid tarsus with longitudinal black stripes on outer side.

Male genitalia (Fig. 7). Uncus sub-quadrate, shallowly concave at middle on posterior margin, covered with dense fine hairs dorsally, with two denticles at basal 1/5. Gnathos arms wide, joined from middle; distal process knife-shaped, pointed apically. Tegumen sclerite triangular, gradually narrowed to obtuse apex. Valva sub-trapezoidal, widened from base to straight terminal margin, rounded at apex, with fine hairs; costa narrowly banded, reaching before apex of valva, sub-rectangular at base; sacculus narrow, ill-defined, half as long as length of ventral margin of valva. Juxta V-shaped, sclerotized anteriorly; lateral lobes short, stout, narrowed from base to apex. Phallus thin, slightly shorter than length of ventral margin of valva, curved before basal 1/3; cornutus fusiform, about 2/5 length of phallus.

Female unknown.

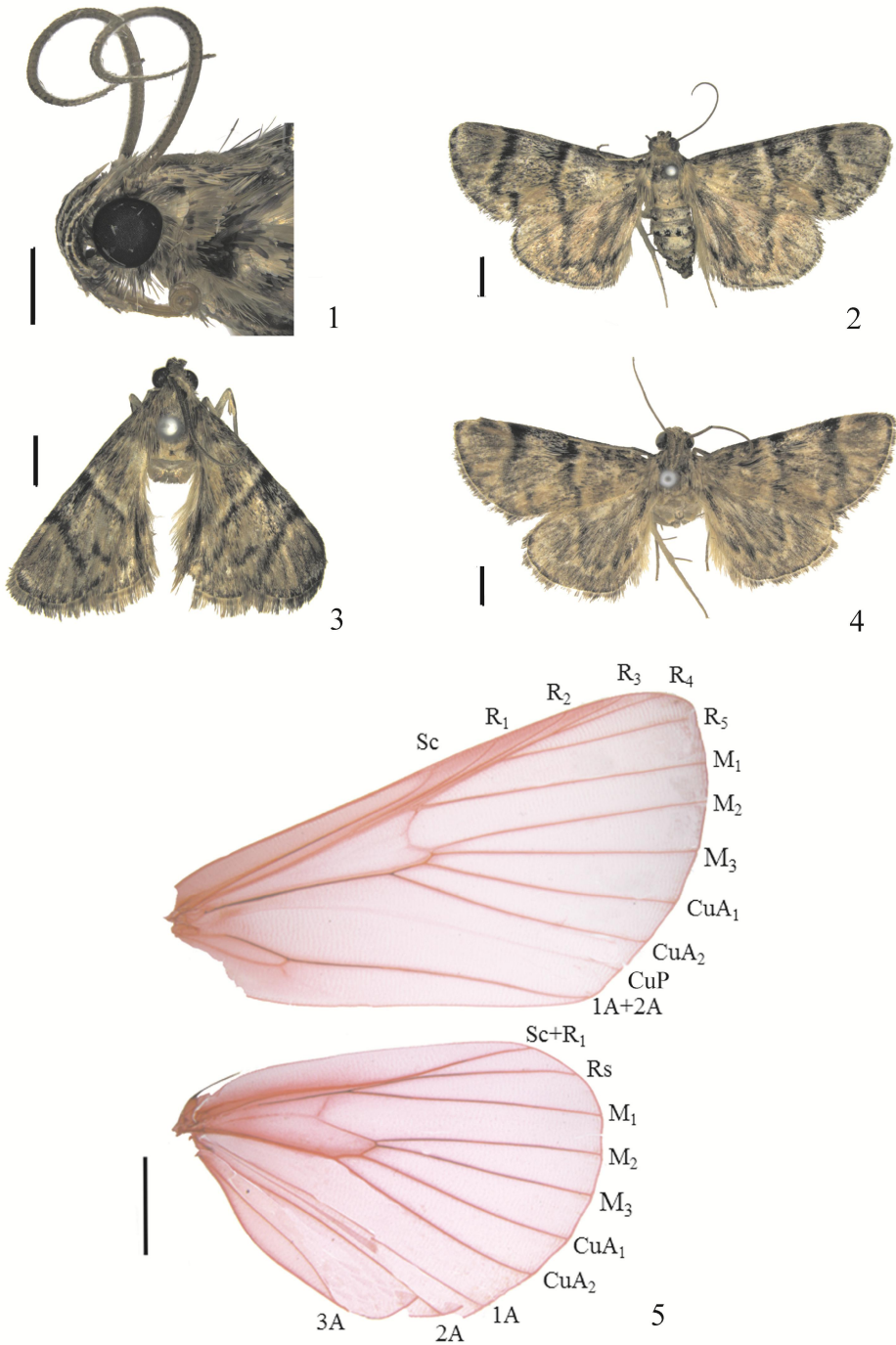
Distribution. China (Hainan).

Etymology. The specific epithet is derived from the Latin word *microdus*, referring to the uncus having two denticles at basal 1/5.

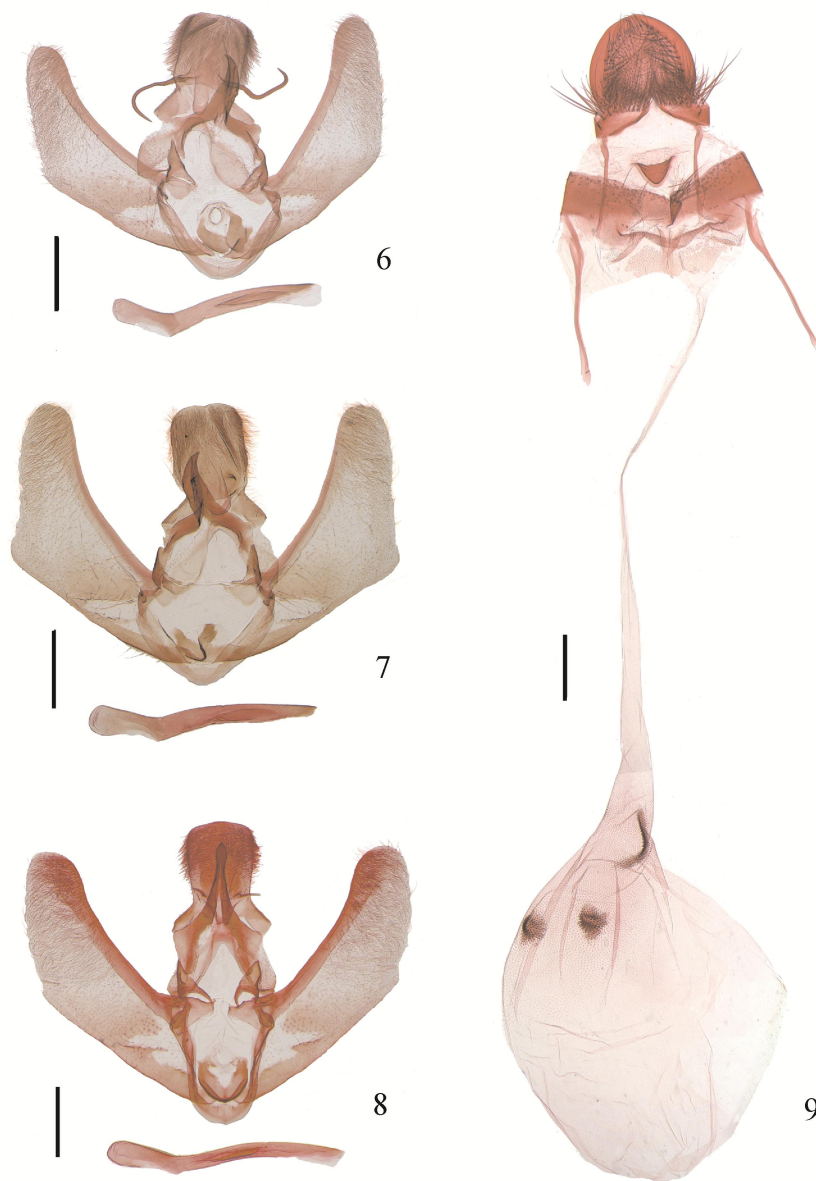
***Pseudocera elliptica* sp. nov.** (Figs. 4, 8)

**Holotype.** ♂, **China**, Limushan Forest Park, 19.1°N, 109.44°E, Hainan, 607 m, 15-V-2015, coll. Peixin CONG, Wei GUAN & Sha HU, slide No. RH16013.

Diagnosis. This species is similar to *P. rubescens* and *P. microda* sp. nov. both in the forewing pattern and in the male genitalia. *Pseudocera elliptica* sp. nov. can be separated from them by the gnathos having a small elliptical distal process and the triangular tegumen sclerite abruptly produced to a spine distally; in *P. rubescens* and *P. microda* sp. nov., the distal process of the gnathos is large knife-shaped, and the triangular tegumen sclerite is gradually narrowed to the apex. More diagnostic characters separating these three species are stated under *P. microda* sp. nov.



Figures 1–5. Morphological characters of *Pseudocera* spp. 1. Head of *P. rubrescens*; 2. *P. rubrescens*, female; 3. *P. microda* sp. nov., holotype, male; 4. *P. elliptica* sp. nov., holotype, male; 5. Venation of *P. rubrescens*, slide No. RH16406W. Scale bars = 1.0 mm (Fig. 1); 2.0 mm (Figs. 2–5).



Figures 6–9. Genitalia of *Pseudocera* spp. 6. *P. rubescens*, male, slide No. RH16014; 7. *P. microda* sp. nov., paratype, male, slide No. RH15518; 8. *P. elliptica* sp. nov., holotype, male, slide No. RH16013; 9. *P. rubescens*, female, slide No. RH16314. Scale bars = 0.5 mm (Figs. 6–8); 1.0 mm (Fig. 9).

Description. Adult (Fig. 4) wingspan 21.0 mm. Head white. Male labial palpus with first segment fuscous mixed with white, about 1/4 length of second; second segment reaching vertex apically, fuscous, with longitudinal white stripes on outer and on dorsal surfaces; third segment white, tapering, about 1/3 length of second. Male maxillary palpus long and brush-like, white. Male antenna with ventral surface blackish fuscous, slightly serrate, dorsal surface white. Scape extension apically reaching middle of metathorax, fuscous mixed with black, with short pale yellow

hair-like scales ventrally and apically. Thorax and tegula pale yellow mixed with blackish gray. Forewing pale brownish yellow, with dense black scales, costal margin with dense white scales between antemedian and postmedian lines; antemedian line black, extending from basal 2/5 of costal margin vertical to basal 1/2 of CuP, then obliquely inward to 1A+2A, finally vertical to middle of dorsum, edged with white fascia along inner margin; postmedian line black, extending from distal 1/3 of costal margin obliquely inward to M<sub>2</sub>, then outward to CuA<sub>1</sub>, again inward to CuP, finally almost vertical to dorsum before tornus, edged with obscure yellowish white fascia along outer margin; terminal line black, interrupted thinly with yellowish white on veins; short yellow stripe from anterior 1/6, 1/2 and 3/5 of postmedian line reaching before apex and terminal line respectively; discal spot absent; discocellular spot represented by black mixed with white tuft; erect black mixed with white hair-like scales below basal half of lower margin of cell, sparse on basal 1/4; cilia blackish gray mixed with yellowish white; basal line white. Hindwing pale brownish yellow, with dense black scales; postmedian line black, serrate, extending from middle of costal margin vertical to M<sub>1</sub>, then obliquely outward to distal 1/3 of CuA<sub>1</sub>, finally inward to distal 1/3 of dorsum, edged with white along its outer margin; cilia yellowish white, interrupted with black on extension of veins. Legs white, mixed with black scales on outer side, fore and mid tarsi with longitudinal white stripes on outer side. Abdomen with dorsal 1st to 4th segments white mixed with black, remaining segments earthy yellow, black on posterior margin of each segment.

Male genitalia (Fig. 8). Uncus sub-quadrate, slightly convex at middle on posterior margin, covered with dense short setae dorsally; paired spine-shaped processes near base more than 1/3 length of uncus. Gnathos arms wide, narrowed from base to joint, joined from distal 1/4; distal process elliptical, narrowly rounded apically. Tegumen sclerite triangular, abruptly narrowed to pointed apex distally. Valva elongate rhomboid, rounded apically, obtuse terminally, with dense short hairs; costa reaching apex of valva, expanded basally, distal 1/4 slightly widened; sacculus narrowed from base to apex, reaching ventro-apical corner of terminal margin. Juxta broad V-shaped, sclerotized anteriorly; lateral lobes short and thick, obtuse apically. Phallus thin, slightly longer than sacculus, curved before basal 1/3; cornutus sub-rectangular, about 1/4 length of phallus.

Female unknown.

Distribution. China (Hainan).

Etymology. The specific epithet is derived from the Latin word *ellipticus*, referring to the elliptical distal process of the gnathos.

## Acknowledgements

We express our thanks to Dr. Dandan Zhang, Biology Museum, Sun Yat-sen University, Guangzhou, Guangdong, for providing some of the specimens used in this study. This research was supported by the National Natural Science Foundation of China (31672372).

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